CASE REPORT

Lipoma arborescens: a rare cause of clicking in the knee

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SUMMARY

Lipoma arborescens (LA) is a rare condition with synovial membrane lipomatous proliferation. It most commonly affects the knee joint, in the suprapatellar pouch. It can present as a painful knee with an effusion. Diagnosis is via MRI demonstrating a synovial mass with frond-like appearance, and histology showing mature adipose cells, with an overlying synovial membrane. Treatment options include non-operative measures with analgesia, or operative intervention to resect the lesion. We describe a unique case of LA present in the anterolateral knee joint, presenting with persistent painful clicking in the knee. The patient underwent an open total resection of the lesion, with resolution of symptoms.

BACKGROUND

Symptoms of knee joint pain and clicking are relatively common presentations in orthopaedic practice. Common causes of clicking in the knee include trauma and degenerative changes (meniscal, articular surface and patellofemoral joint pathology). We describe a rare case of lipoma arborescens (LA) as a cause of pain and clicking in the knee joint.

CASE PRESENTATION

A 48-year-old man presented with a 6-month history of right knee pain and swelling, associated with a clicking sensation under the anterolateral aspect of his patella. His symptoms of pain and stiffness were worse in morning and improved during the day, and were not aggravated by activity.

His past medical history included a previous knee injury 8 years prior, resulting in a medial meniscal tear which did not require further intervention, and his symptoms improved over time. He was a non-smoker, non-diabetic and had no rheumatological history.

On examination, the patient had a full range of movement in his knee, and his knee was stable. There was a palpable clunk on the anterolateral joint line with flexion and extension of the knee, as well as a palpable lump at the anterolateral joint line.

INVESTIGATIONS

Plain film radiographs demonstrated a knee effusion but no bony changes or an obvious soft tissue mass.

MRI showed a joint effusion, with synovial lipomatous proliferative disease with a frond-like appearance (figure 1).

TREATMENT

A knee arthroscopy was performed and a posterior horn medial meniscal tear was noted and debrided to a stable margin. The joint was grossly synovitic with a frond-like mass, for which arthroscopic debridement was attempted (figure 2). An open approach lateral sided incision was required to completely excise the mass. Histology of the lesion noted fatty tissue covered with a mildly inflamed synovium, consistent with a diagnosis of LA. Fluid culture from the knee showed no growth of organisms.

OUTCOME AND FOLLOW-UP

The patient's symptom of pain, swelling and clicking resolved postoperatively, and he was followed up at 2 weeks after the operation.

DISCUSSION

LA is a rare condition that is characterised by chronic synovial membrane lipomatous proliferation, a process in which mature adipocytes replace subsynovial tissue.¹ Albert Hoffa described lipomatous abnormalities of the knee joint in 1904 and attributed the term 'lipoma arborescens' to Johannes Müller.² The name is derived from the 'tree-like' appearance of the lesion (*Arbor* meaning *tree* in Latin).

Aetiology

The cause of LA is unknown. It has been associated with osteoarthritis, rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, gout, joint trauma, diabetes mellitus and high body mass index.^{3–11} There is a hypothesis that LA may be due to a chronic inflammatory process, as evidenced by mononuclear cell infiltration in the synovial membrane.¹ It is uncertain whether these conditions predispose towards developing LA or whether they are coincidental.¹

Figure 1 MRI showed a joint effusion, with synovial lipomatous proliferative disease with a frond-like appearance.

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Figure 2 Arthroscopic imaging showing a grossly synovitic knee joint with a frond-like mass.

Presentation

LA is most common in the third– fifth decade of life with a predilection in males.¹

The condition most commonly involves the knee joint, however it has been described in the wrist, hip, shoulder and ankle joints.^{9 12–15} Within the knee, the most common site is the suprapatellar pouch. LA is characterised by slowly progressive symptoms of joint pain, with stiffness and an effusion, with cyclic variation of symptoms.¹⁶

Diagnosis

X-ray films may show tissue hyperdensity in the suprapatellar pouch. CT scans show a synovial mass of similar density to fat, that is non-enhancing with contrast administration.¹⁷

MRI has been considered to be diagnostic, and characterised by a synovial mass with frond-like architecture, and fat-equivalent signal on all pulse sequences, which does not enhance with contrast administration.¹⁶ Furthermore, there is an absence of effects from haemosiderin, which would otherwise be noted in pigmented villonodular synovitis.^{1 16} Joint fluid aspiration results are often non-specific as are routine investigations used to rule out other causes of joint pain and swelling.

Histological findings of LA include mature adipose cells, with an overlying synovial membrane, with synovial cells being enlarged and reactive.^{1 16} This is in contrast to intra-articular lipomas, which rather than being covered in synovium, have a thin fibrous layer, and are usually present as a rounded mass.¹⁶ Furthermore, LA is usually found in the suprapatellar pouch, rather than intra-articular lipomas and haemangiomas, which are often found near the infrapatellar fat pad.^{16 17} Another differential for LA is synovial osteochondromatosis, which involves metaplastic proliferation of the synovial membrane, and therefore its appearance on MRI can be varied due to ossific or calcified lesions.¹⁶

Treatment options

Non-operative options include symptom control via analgesia and anti-inflammatory medications, with a role for corticosteroid injections.

Definitive management involves surgical resection via either an arthroscopic or open approach.

Recurrence following surgical excision is rare.^{11 16 18 19} An isolated case of treatment by Yttrium-90 radiosynovectomy has been reported, without further recurrence.²⁰

Learning points

- ▶ Chronic pain and joint swelling should be investigated with plain film radiographs, MRI, and if necessary joint aspiration.
- ▶ LA can be a rare cause of clicking in the knee.
- ▶ Diagnosis of LA is via MRI showing a frond-like appearance, as well as histology.
- ▶ Definitive management can be achieved with gross total resection of the lesion.

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